

A NEW HERMIT CRAB (DECAPODA: PAGURIDAE) FROM ROCKY SHORES OF THE OGASAWARA (BONIN) ISLANDS

Akira Asakura

Abstract.—A new species of hermit crab (Family Paguridae) from the Ogasawara (Bonin) Islands, *Pagurus insulae*, is described, illustrated, and compared with closely related species.

The Ogasawara (Bonin) Islands are subtropical oceanic islands located in the north-west Pacific (27°N, 142°E). More than 50% of the terrestrial species there are endemic, as also are several of the marine species (Shigei 1970, Habe et al. 1978).

Several investigations have been done on the marine fauna of the islands, and a number of species of hermit crabs have been recorded (Hirota 1894, Yoshiwara 1901, Stimpson 1907, Terao 1913, Melin 1939, Imajima 1970, Ooishi 1970, Sugano 1974, Takeda 1981). Among these is an undetermined species of *Pagurus* (Ooishi 1970, Shigei 1970). This is possibly the same one collected on the islands of Chichijima and Hahajima of the Ogasawara Islands during our field work in 1986 and 1989, and that is here described as *Pagurus insulae*, new species.

The terminology used herein follows that of McLaughlin (1974). The size range of the specimens are given in parentheses under "Material examined," showing the shield length (SL in mm). The type material is deposited in the Natural History Museum and Institute, Chiba (CBM).

Pagurus insulae, new species
Figs. 1, 2

Material examined.—Okumura, Sakaiura, and Toufu-iwa on Chichijima Island, Ogasawara Islands: 15 males (SL = 1.55–3.10 mm), 11 females (SL = 1.60–2.90 mm). The largest male is the holotype, CBM-ZC-

00711. Shells; *Monodonta australis* Lamarck, *Diloma suavis* (Philippi), *Nodilittorina pyramidalis* (Quoy & Gaimard), *Nodilittorina quadricinta feejeensis* (Reeve), *Supplanaxis niger* (Quoy & Gaimard), *Cannarium mutabilis* (Swainson), *Maculotriton serriialis* (Deshayes), *Drupa ricinus hadari* Emerson & Cernohorsky, *Telasco sufflatus* (Gould), *Telasco velatus* Gould.

Description.—Shield nearly as long as broad; anterolateral margin sloping; anterior margin between rostrum and lateral projections slightly concave; posterior margin roundly truncate; dorsal surface nearly smooth and with tufts of setae; anterolateral angle unarmed.

Rostrum moderately short, slightly exceeding lateral projections, obtusely triangular, terminating in blunt tip. Lateral projections broadly and obtusely triangular.

Ocular peduncles moderately long, one-half length of shield, somewhat inflated basally, corneae slightly dilated; dorsal and dorsomesial faces each with longitudinal row of few short setae. Ocular acicles large, subtriangular, mesial margins expanded, lateral margins broadly expanded basally, medially excavated, terminating in small acute marginal spine; separated basally by $\frac{2}{3}$ basal width of one acicle.

Antennular peduncles short, equaling length of ocular peduncles. Ultimate segment with few distal setae. Penultimate and basal segments unarmed.

Antennal peduncles moderately short but equally as long as ocular peduncle. Fifth and

fourth segments unarmed, each with few tufts of short setae. Third segment with distoventral spine. Second segment with dorsolateral distal angle produced, terminating in acute spine, mesial margin unarmed, lateral margin with row of long setae, dorsomesial distal angle with small spine. First segment with small spine on distolateral margin.

Mandible without distinguishing characters. Maxillule with proximal endite subquadrate; endopod with strong bristle on internal lobe; external lobe obsolete. Maxilla with endopod inflated basally and slightly exceeding scaphognathite. Third maxilliped with an accessory tooth on crista dentata on ischium; merus and carpus unarmed.

Right cheliped large and elongate, length about 3.25 times that of shield. Dactyl moderately short and broad, $\frac{3}{4}$ length of palm, terminating in small corneous claw; cutting edge with row of strong calcareous teeth; dorsomesial margin with few tufts of setae and with slightly elevated longitudinal row of small spines; dorsal face with scattered, moderately strong spines and with 2 rows of tufts of stiff bristles; ventral face and ventrolateral margin with tufts of setae. Palm long, $\frac{2}{3}$ length of carpus; dorsomesial margin with tubercles; dorsal surface with closely-spaced spines or tubercles (mainly on posterior half of palm) and moderately dense short setae; dorsolateral margin with single or double row of spines continued onto fixed finger and with scattered short setae; ventral surface with scattered, closely-spaced, blunt tubercles of various sizes and few tufts of short setae; dorso- and ventro-mesial margins of fixed finger each with rows of tufts of stiff bristles. Carpus moderately long, slightly longer than merus; dorsomesial margin with single or double row of small tubercles; dorsal surface with closely-spaced, spinulose tubercles and dense short setae; lateral, mesial, and ventral surfaces with closely-spaced tubercles and tufts of short setae. Merus subtriangular; dorsal surface

with irregularly scattered low tubercles of various sizes and tufts of stiff setae; distal margin unarmed; ventromesial margin with single, irregular row of small spines; lateral face somewhat tuberculate, ventrolateral margin with irregular row of small tubercles; ventral surface with scattered small tubercles and tufts of setae. Ischium with tubercles and few short setae on ventromesial margin. Coxa with irregular row of small spines on ventromesial margin.

Left cheliped considerably shorter than right, reaching to proximal margin of right palm. Dactyl moderately long, 1.5 length of palm, slightly skewed laterad; cutting edge with row of dense corneous teeth on proximal half, terminating in strong corneous claw, slightly overlapped by fixed finger; prominent hiatus between dactyl and fixed finger; dorsomesial margin with tufts of stiff setae; dorsal surface spinulose and with scattered tufts of long setae. Palm moderately short, $\frac{4}{7}$ length of carpus; dorsal surface with irregular rows of small spines or 2 rows of tubercles and scattered tufts of long setae; lateral, mesial, and ventral surfaces tuberculate, with tufts of long setae; fixed finger terminating in strong corneous claw. Carpus moderately long, approximately equaling length of merus; dorsal surface with 2 rows of spines and tufts of long setae; lateral face tuberculate; mesial face with few scattered, low tubercles; ventral surface tuberculate and with tufts of long setae. Merus subtriangular, dorsal surface with irregular rows of low tubercles and tufts of long setae; lateral face somewhat tuberculate; ventrolateral margin with row of small spines increasing in size distally; ventral surface with tufts of long setae distally; ventromesial margin with tufts of long setae; lateral face with scattered short setae. Ischium with row of denticles on ventromesial margin, ventral surface with tufts of long setae. Coxa with spinules on ventromesial and ventrolateral margins, distal margin with tufts of long setae.

Second pereopods moderately short, not

overreaching right cheliped. Dactyl long, slender, $\frac{4}{5}$ length of propodus, straight in lateral and dorsal view, terminating in strong corneous claw; dorsal surface with few tufts of short setae; lateral face with irregular row of tufts of short setae; mesial face with few tufts of short setae and single row of 5–7 small corneous spinules; ventral surface with 2 rows of tufts of long setae and row of 5–8 strong corneous spines increasing in size distally. Propodus moderately long, about 1.14 length of carpus; dorsal margin with double row of tufts of long setae and row of very low protuberances; lateral face with scattered tufts of moderately long setae and few spinules; mesial face with scattered tufts of long setae and few spinules; ventral face with two rows of tufts of long setae and two distinct corneous spines on distal margin. Carpus moderately long, $\frac{3}{4}$ length of merus; dorsal surface with row of tufts of long setae and single distal marginal spine; lateral face with scattered tufts of long setae; mesial face with few tufts of setae; ventral surface with tufts of long setae on distal margin and midpoint. Merus laterally compressed; dorsal surface with row of low protuberances and single or double row of tufts of long setae; lateral and mesial surface with few short setae; ventral margin with strong spines and tufts of long setae. Ischium with long setae on dorsal margin; ventral surface with row of tufts of setae, terminal tuft composed of pronounced long setae. Coxa with short setae on ventrolateral margin; ventromesial margin with tufts of long setae and low protuberances.

Third pereopods approximately equaling length of second pair. Dactyl elongate, slender, equaling or slightly longer than propodus, slightly curved in lateral view, straight in dorsal view, terminating in strong corneous claw; dorsal surface with row of short setae; lateral face with few tufts of short setae; mesial face with 2 rows of 3–5 small corneous spines and few tufts of setae; ventral surface with row of 7–9 strong corneous spine increasing in size distally and with

accompanying tufts of setae. Propodus long, about 1.20 length of carpus; dorsal surface with row of low protuberances and 2 rows of tufts of long setae; lateral and mesial face with scattered few setae; ventral surface with row of 4–6 small corneous spines and a double row of strong spines at distal end. Carpus $\frac{3}{4}$ length of merus; dorsal surface with row of very low protuberances and tufts of long setae, distal margin with strong spine; lateral face with irregular rows of tufts of long setae; mesial and ventral faces with few tufts of long setae. Merus laterally compressed; dorsal surface with row of low protuberances and a double row of tufts of long setae; mesial and lateral faces with few tufts of setae; ventral margin with tufts of long setae. Ischium with long setae on ventral and dorsal margins; lateral and mesial faces unarmed. Coxa with tufts of long setae on ventromesial margin and distal end of ventral surface; few short setae on ventrolateral margin.

Anterior lobe of sternite of third pereopod subsemicircular, anterior margin with long setae and few spinules.

Telson with posterior lobes asymmetrical (left slightly larger), separated by median cleft; terminal margins with series of very tiny spines; lateral margins with three or more setae; anterior lobes each with long setae laterally and scattered setae of several lengths on surface.

Coloration. — In life: generally gray-green. Chelipeds pale blue-green with white bands on dactyl, fixed finger and proximal portion of merus; 2–3 blue-gray stripes on surface of palm. Ambulatory legs pale blue-green with dark brown stripes on dorsal, lateral and mesial surfaces of dactyl, propodus, and carpus and on dorsal and lateral surfaces of merus. Shield generally pale gray-green with scattered small dark blue-green patches. Ocular peduncles pale green with few white patches dorsally and mesially and dark gray patch at central portion.

In preservative (formalin): generally yellow-orange. Chelipeds with white closely-

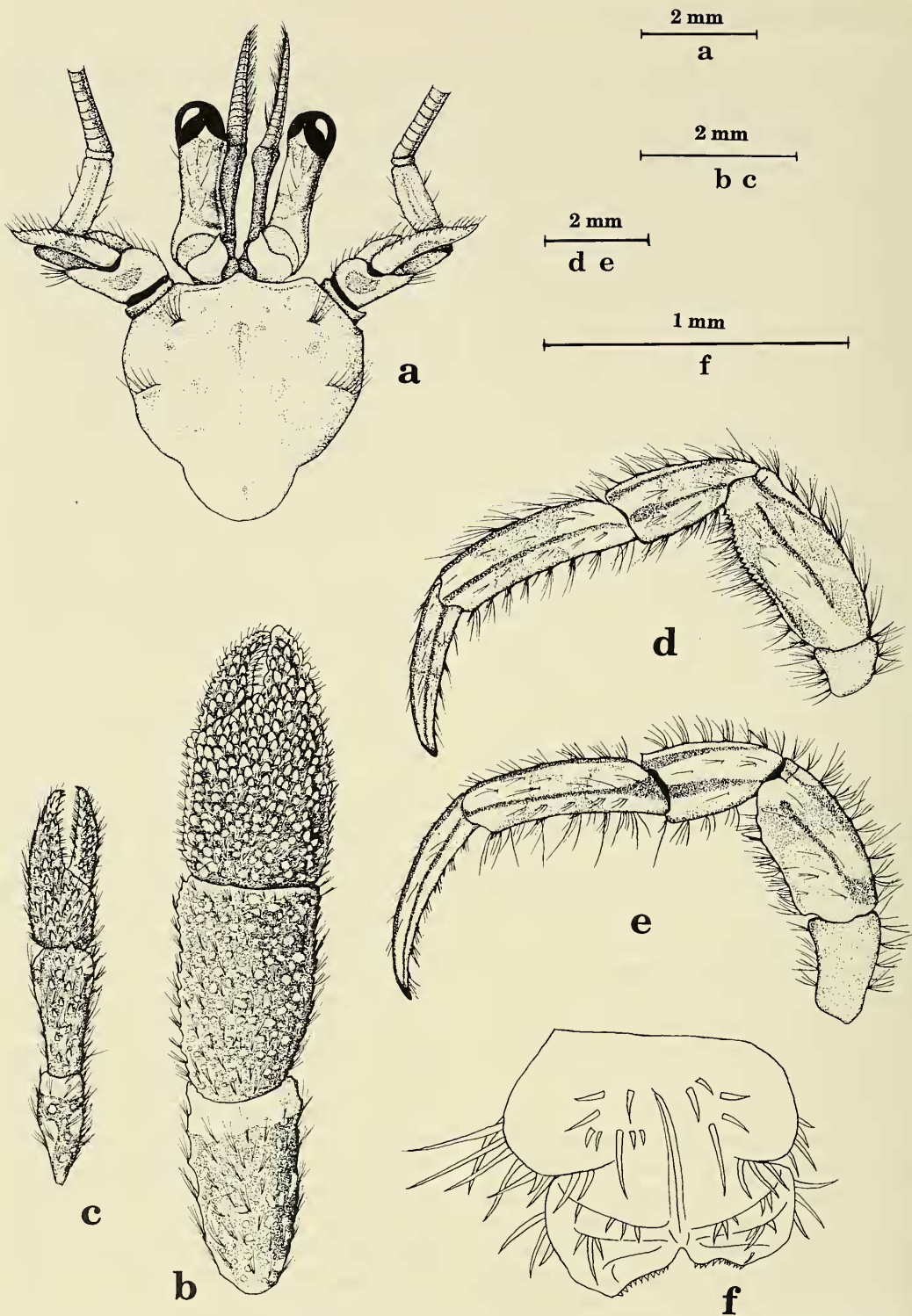


Fig. 1. *Pagurus insulae*, new species. Holotype, male (SL = 3.10 mm): a, shield and cephalic appendages; b, right cheliped, dorsal view; c, left cheliped, dorsal view; d, left second pereopod, lateral view; e, left third pereopod, lateral view; f, telson.

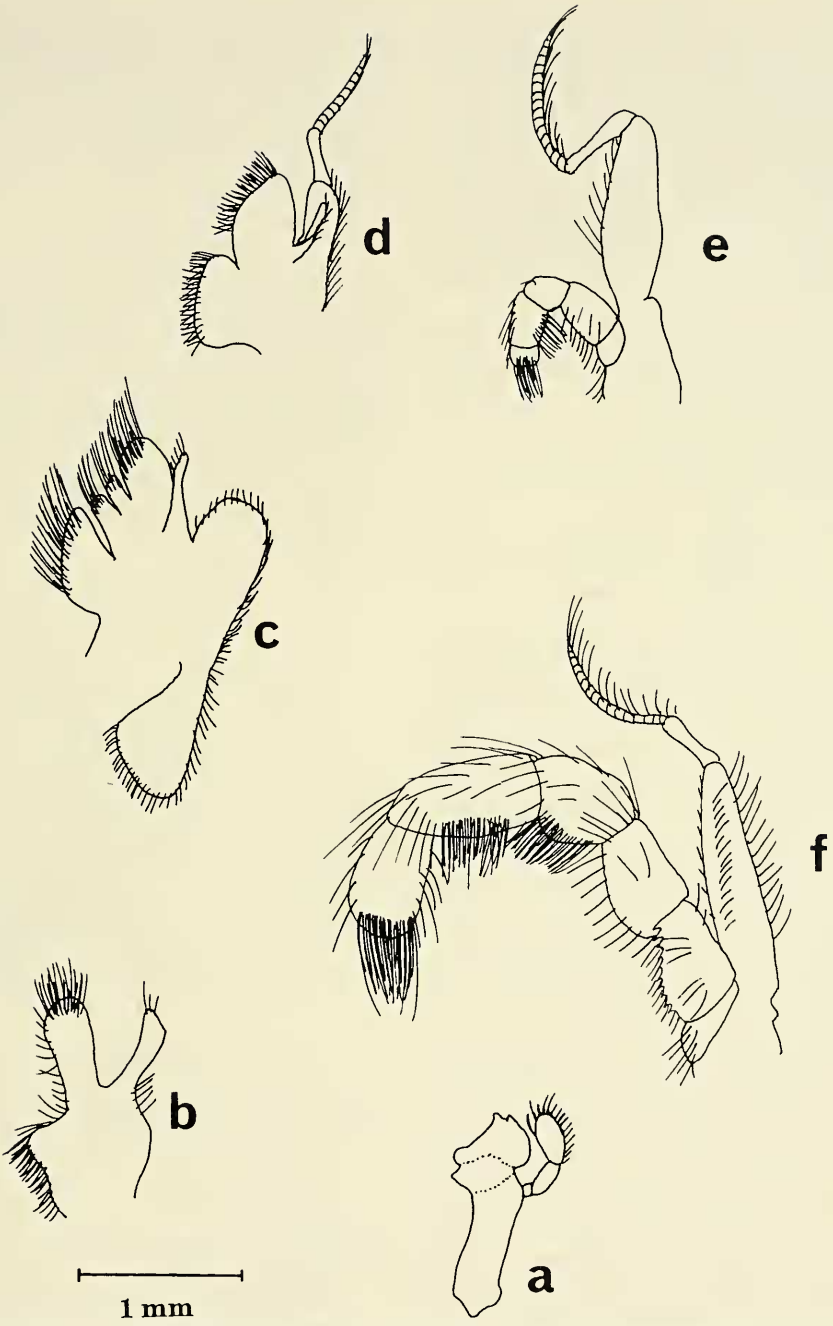


Fig. 2. *Pagurus insulae*, new species. Paratype, male. (SL = 3.00 mm). Mouthparts (right, internal view): a, mandible; b, maxillule; c, maxilla; d, first maxilliped; e, second maxilliped; f, third maxilliped.

spaced spines or tubercles on dactyl, palm and carpus; proximal portion of dorsal, mesial and lateral surfaces of merus with white bands. Ambulatory legs with red stripe on dorsal, lateral and mesial surfaces of dactyl, propodus, and carpus and on dorsal and lateral surfaces of merus. Shield whitish with small yellow patches. Ocular peduncles yellow-orange with few white patches dorsally and mesially.

Habitat.—The species was found in the intertidal zone of rocky shores and boulder beaches on Ogasawara.

Etymology.—This species is found in the oceanic island of Ogasawara and derives its name from the Latin “insula.”

Remarks.—The new species shares many diagnostic characters with *Pagurus geminus* McLaughlin, 1976; however, there is no doubt that two species are distinct. The dactyls and propodi of the third pereopods of *P. geminus* each have a group of short spines on the ventrolateral face; the meri of the chelipeds each bear a blunt ventroproximal process. These spines and processes are absent in *P. insulae*. Color differences also readily distinguish the two species. The new species has dark brown stripes on the second and third pereopods, whereas *P. geminus* has broad white bands on the proximal and distal portions of the dactyls of the same (see Miyake 1982: pl. 44, fig. 5).

In having striped walking legs, *P. insulae* appears similar to *P. pilosipes* (Stimpson, 1858); however, the stripes are more reddish in the new species and the meri of its chelipeds lack the white distal band present in *P. pilosipes*. Examination of comparative material of *P. pilosipes* taken from Shiraiwa-zaki, Tomioka, the Amakusa Shimoshima Island, north western Kyushu, now in the collection of CBM, discloses that it is also readily distinguished from the new species by pronouncedly setose pereopods as suggested by the specific name. Also, the meri of the chelipeds of *P. pilosipes* bear two prominent ventroproximal processes, the propodus of the left third pereopod bears

a group of small spines on the ventrolateral face, and the right cheliped bears 5–7 longitudinal rows of more prominent spines.

Distribution.—Okumura, Sakaiura, and Toufuiwa on Chichijima Island, the Ogasawara Islands.

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